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FAX COVER SHEET

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Comments:

Per your request, following are discussion points for Tuesday at 2:00 PM

Thank you in advance for you consideration.

Sincerely,



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Interview Discussion points

Application No. 09/351,892

single camera - filed 7/13/99 - c-i-p of app. filed 1/16/98

Claims 30-66 pending

Claims 30-32 allowed

Claims 33-66 rejected, as least in part based both Toh '055 and Toh '040

Toh '055 has filing date of 1/24/98, but effective filing date for claims is 7/13/99 since 1 camera embodiment lacks 112 support in priority app.

Both Toh patents deal with gull-wing lead inspection of IC packages, which only have leads on the periphery. Neither deal with BGAs, nor can they be used to deal with an "array of balls" or "array of ball leads". We could possibly modify the claims accordingly.

Toh '055 use backlighting (silhouette) for the side view that is inappropriate for BGAs.

Toh '040 images only one edge at a time, so it rotates (not fixed optical system) and requires at least 4 frame grabs. Further, it teaches orthogonal views that cannot image the multiple rows found in BGAs.

Application No. 09/844,232

CIP2 - single camera - filed 4/27/01 - c-i-p of CIP1

Claims 1-120 pending

No claims allowed

Some claims rejected based upon Liu patent and "Vision-based..." publication. However, both are structured light systems - not fixed optical systems using 2 images for all information. Light source must be scanned and each ball imaged. Therefore not a fixed optical system as in the claims.

Some claims rejected based on Toh '055 and Toh '040.

As above, both Toh patents deal with gull-wing lead inspection of IC packages, which only have leads on the periphery. Neither deal with BGAs, so clarifying

"leads" in claims as "array of balls" or "array of ball leads". Potential claim modification may be appropriate.

Toh '055 use backlighting (silhouette) for the side view that is inappropriate for BGAs.

Toh '040 images only one edge at a time, so it rotates (not fixed optical system) and requires at least 4 frame grabs. Further, it teaches orthogonal views that cannot image the multiple rows found in BGAs.

Application Non 09/844,626

CIP3 - single camera - filed 4/27/01 - c-i-p of CIP1
Claims 1-88 pending
No claims allowed

All claims rejected under 112 1st based on single sensor limitation.

Review of Figures 15-18 showing how to use a single camera to obtain both views will assist in this rejection.

All claims rejected based, at least in part, upon Liu patent and "Vision-based..." publication. However, both are structured light systems - not fixed optical systems using 2 images for all information.

Please consider "broadest REASONABLE interpretation CONSISTENT with specification" since applicant disclosed prior art structured light systems noting that the present invention is different and therefore it is unreasonable to interpret claims broadly enough to allow these to read on claim limitations.

Summary:

Thus discussion will address at least the issues that:

BGAs are a limitation that takes the Toh references out of consideration since Toh cannot perform BGA analysis (Toh teaches nothing about BGA inspection, only gull-wing lead inspection on ICs), and the "broadest reasonable interpretation" must also be "consistent with the specification" so that side perspective view of a ball grid array must be less than 90 degrees from the bottom view (since > 90 deg., like in Toh, would not image the array since it is from behind);

Additionally, applicant has identified in the specification that says laser range finding is prior art method requiring multiple measurements such that considering a laser as the illumination means is inconsistent with the specification

CIP2 and CIP3 have apparatus claims, but the rejected claims mention BGA/ball arrays in the preamble and balls in the body, so Toh should not apply as noted above. Further the specification says structured light/laser range finding are prior art methods requiring multiple measurements such that considering a structured light or laser as the illumination means is inconsistent with the specification